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ETHNOMEDICINE OF MUKUNDARAS (S. E. RAJASTHAN)—PLANT REMEDIES USED IN *GUINEA WORM* (*NAARU*) DISEASE

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ABSTRACT

The communication deals with enumeration of plant species used by tribals and rural people residing in the vicinity of Mukundara ranges, Jhalawar district (S.E. Rajasthan), as hebral medicine for *Guinea worm* (Naaru) disease. This disease is very common in tribal and rural areas of South East Rajasthan, and is communicated through contaminated water. The 12 plant species, along with their plant parts used are — *Arisaema tortuosum* (Tuber), *Aristolochia bracteolata* (Root), *Blumea lacera* (leaf), *Calotropis procera* (Root), *Cleome viscosa* (leaf), *Ferula asafoetida* (Oleoresin Root), *Hemiadelphis polyspermus* (Root), *Piper betel* (leaf), *Psoralea corylifolia* (Seed), *Pueraria tuberosa* (Root), and *Ricunus communis* (Root). Enumeration contains, Plant's name, Family, Local name, Voucher specimen and Phenology along with brief notes on preparation of plant drug, the plant part used, amount and periodicity of dosage given.

Brief notes on causal organism *Dracunculus medinensis* (Guinea worm) also given along with etiology, symptoms and mode of infection.

INTRODUCTION

The Mukundara hills which are continuation of Vindhyan series of hills enter Jhalawar district (S. E. Rajasthan) from Malwa plateau of Madhya Pradesh. These ranges are thickly covered with forest and are inhabited by some tribal societies viz. *Bhils* and *Moghiyas*. However, these forests are now being destructed for various purposes eg. timber, fuel, and food.

Due to poor sanitation in the tribal villages, *Guinea worm* (Naaru or Bala) disease is very common amongst the tribals and rural people of Mukundara ranges as well as in Banswara and Dungarpur districts in Rajasthan.

DISEASE CHARACTERISTICS

Causal organism : A nematode known as *Dracunculus medinensis* (*Guinea worm*) commonly known as *"Naaru"* or *"Bala"* in S. E. Rajasthan.

Host : Primary host - Man. Secondary host - Cyclops (a crustacean).

Distribution : Jhalawar, Banswara and Dungarpur district of S. E. Rajasthan.

Symptoms : Formation of blisters on the joints of human body which ultimately leads into formation of ulcers. These ulcers burst when human body comes in contact with water, and body of female worm is projected out of ulcer. It is at this stage that native doctors grasp the end of worm and slowly but carefully wind it on the stick, but in the process if the worm is broken into two then infection may be more severe and some times may prove fatal. The ulcers cause a severe pain and itching. Besides this, asthma, urticaria, dyspepsia, nausea and vomitting may be also observed in the patient.

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Etiology & Infection : The adult worms are filiform in shape. Males are 12-40 mm long and .4 mm in diameter while females measure 70-120 mm & .9-1.7 mm respectively. The adult worms live under the deeper layers of skin in human body and look like coiled vericose vein. Male worm dies after fertilization of females which migrate to such parts of body just beneath the skin which come in contact with cold water and are periodically bathed eg. hands, legs and backs (of water carriers) etc. It is at this stage blisters which are formed in human body due to secretion of toxic substance lead to formation of ulcers, and the ulcers burst on contact with water. Urinogenital organ of female now freely projects from the ulcer and numerous tiny, coiled, larvae are released into the water, which after leading a short, free swimming life are ingested by cyclops (a small free swimming crustacean) which serves as an intermediate host. The larvae in cyclops undergo 2 moultings and attain infective stage in 3 weeks. These infected cyclops when taken by man along with unfiltered drinking water transport the worms into human body. The young *Guinea worm* develops to mature stage in the human body in subcuteneous tissues.

Spread & recurrence : Through unfiltered, dirty, and cyclops contaminated water. The cyclops ingest "*Guinea worm*" larvae. These larvae are transported to human body along with cyclops infested impure drinking water.

Predisposing factors : Warm, humid, and typical type of tropical conditions, abundance of cyclops population in water.

PREVIOUS WORK

Ethnobotanical studies in different parts of Rajasthan were started in late seventies and are still under initial phase. However, Singh and Pandey (1980), Joshi (1982, 1985 & 1986) and Sharma, Shringi and Tiagi (1985) have enumerated some plants of Aravallis and Mukundaras used by the tribals of South-East Rajasthan, Banswara, Dungarpur and Jhalawar districts. However, none of them have made efforts to make investigations about plant remedies used for the treatment of *Guinea worm disease* so far.

METHODS

For making detailed and thorough Ethnomedicinal studies about the plant drugs utilized for the treatment of *Guinea worm* (Naaru) infestation, intense explorations were organized in the tribal and rural areas of Mukundara ranges in Jhalawar district. These areas have been touched at diverse places; roadside localities were covered by vehicles, while some remote places in Aklera, Manoharthana, and Gangdhar tehsils were travelled by bicycles or on foot. These studies were carried out in different seasons since 1986, and are still going on.

Plants utilized for the remedy of *Guinea worm diseases* were collected. Complete information about their local names, parts of the plant utilized, mode of application, specificity and periodicity of the doses were properly recorded. All these information were noted after repeated discussions, and interviews with tribal chieftains, Ojhas, Bhopas, Mukhias of the clan (Patels), and with rural doctors (Vaidyas). In some cases help was also sought from elderly villagers. The specimens were identified with the help of local floras and deposited in Herbarium University of Rajasthan, Jaipur (RUBL).

COMMUNITY CHARACTERISTICS

The houses in tribal and rural communities are distributed in somewhat haphazard manner, without proper sanitation, and in most unhygenic conditions eg. unfiltered and contaminated drinking water, poor sanitation and sewage system and malnutrition. All the above mentioned conditions are responsible for most of epidemic and communicable diseases eg. cholera and diarrhoea etc. However, low sanitation is sometimes compensated by natural environment of forests.

Based on the investigations, the plants used for remedial purpose have been enumerated in alphabetical order alongwith their local names, families, voucher specimen no., locality, phenology and plant drug therapy. Twelve species are enumerated in the paper but the work is still continuing. It is hoped that after thorough screening this data may be helpful to add information about safe, chief, and effective remedies in *"Guinea worm"* (Naaru disease) and thus will be great use to the society.

ENUMERATION

1. **Arisaema tortuosum** (Wall.) Schott (Araceae) *Ghotukand.*

A tuberous perennial herb of shady and waste places. Leaves pedipartite, petioles long, leaflets ovate lanceolate; spathe purple pale green.

Spec. Loc. Cit. : Radi, RUBL 11088 (*NKS* 919).

Flowering & Fruiting : July-November.

Medicinal Use : Before drug therapy 50 gms of pure ghee is given to patient orally to neutralise the advarse alkaloid effect of tuber. Then 2 gms of crushed fresh or dried tuber is given orally with water once a day for 3 days. This is said to be an effective treatment to eradicate female worms in human body in the initial stages itself.

2. **Aristolochia bracteolata** Lamk. (Aristolochiaceae) *Kalipaad.*

A diffuse prostrate perennial herb of waste places, leaves ovate; cordate at the base, flowers purple; capsules oblong.

Spec. Loc. Cit. : Pygah, RUBL 11095 (*NKS* 960).

Flowering & Fruiting : August-October.

Medicinal Use : Fresh leaves are crushed into paste. 10 gms of paste is applied with neat cloth around the ulcer of *Naaru* (Guinea worm). It expells the worm easily.

3. **Blumea lacera** (Burm. f.) DC. (Asteraceae) *Kakrönda.*

A strong smelling herb of shady places with variable and sessile leaves. Heads pale yellow, in axillary cymes.

Spec. Loc. Cit. : Gokulpura, RUBL 11516 (*NKS* 1289).

Flowering & Fruiting : January-June.

Medicinal Use : Fresh leaf extract 10 gms is given orally with 10 gms honey, only once a day for 3 days. It is said to destroy *Naaru* (Guinea worm) in initial stages of infection itself.

4. **Calotropis procera** (Ait.) R. Br. (Asclepiadaceae) *Aankdo.*

An erect laticiferous shrub of dry and waste places; leaves ovate-obovate; flowers purplish red, follicles recurved.

Spec. Loc. Cit. : Mangalpura, RUBL 18053 (*NKS* 1409).

Flowering & Fruiting : December-May.

Medicinal Use : Fresh or dried root of the plant crushed with water, and the paste thus prepared given orally to the patient once in a day for 3 days, is said to be effective treatment for *Naaru* disease, for destruction of cyclops and larvae in the intestine itself.

5. **Cleome viscosa** L. (Capparidaceae) *Hul-Hul.*

A common annual erect, pubescent glandular weed of open and waste places, leaves tripentafoliate, flowers yellow, capsules narrowed.

Spec. Loc. Cit. : Talai, RUBL 9266 (*NKS* 14).

Flowering & Fruiting : July-October.

Medicinal Use : Fresh leaves of mature plant are crushed into paste. 10 gms of paste is applied on worm infected ulcer with a neat and dry cloth. This, is said to expel the worm from the ulcer.

6. Ferula asafoetida L. (Apiaceae) *Hing.*

A parennial herb of Punjab and Kashmir not grown in the area surveyed. But the gum-resin obtained from roots, commonly sold in markets and widely used as a condiment for flavouring the food.

Medicinal Use : 2 gms hing powder given orally with water once a day for a month. It is said to be an excellent prophylactic drug for *"Guinea worm"* disease. It is reported that its use is fatal to the larvae of *"Guinea worm"* in the human intestine.

7. Hemiadelphis polyspermus Nees (Acanthaceae) *Kalabichchhu.*

A small procumbent herb in wet and shady places ; leaves oblong-obovate, sessile ; flowers small, pale blue ; capsules oblong.

Spec. Loc. Cit. : Jhirniya, RUBL 15707 (*NKS* 99).

Flowering & Fruiting : August-February.

Medicinal Use : Fresh root of the plant is crushed into paste. 5 gms of the paste given orally to the patient with or without water for destruction of worms.

8. Nerium indicum Mill. (Apocynaceae) *Lal Kaneer.*

An evergreen shrub found growing naturally in low-lying habitats, flowers white-dark red, fragrant.

Spec. Loc. Cit. : Gindore RUBL 11139 (*NKS* 781).

Flowering & Fruiting : Throughout the year.

Medicinal Use : Fresh or dried root of the plant is powdered, 5 gms powder is mixed with water and it is given to patient once a day. It is considered as an effective prophylactic therapy.

9. Piper batle L. (Piperaceae) *Nagarbeldo.*

A climbing perennial found cultivated in the area. Leaves cordate.

Spec. Loc. Cit. : Raipur, RUBL 17757 (*NKS* 1209).

Flowering & Fruiting : October-January.

Medicinal Use : Three or four fresh leaves are tied on the worm ulcer, in such a way that dorsal part of the leaf should be towards inner side, some peppermint powder (5 gms or 10 gms) is also applied on the blister or ulcer before tying the leaves. It is a common practice to expell the worm out from patient's body.

10. Psoralea corylifolia L. (Fabaceae) *Bakhni.*

An annual hairy and glandular herb, leaflets solitary, ovate ; flowers purple, pods oblong.

Spec. Loc. Cit. : Jhalrapatan RUBL 11161 (*NKS* 950).

Flowering & Fruiting : December-April.

Medicinal Use : Dried seeds are powdered and 10 gms of powder is given twice a day orally with water. This treatment is continued for 5 days. This practice is much effective for complete destruction of *Naaru* in the human body.

11. Pueraria tuberosa (Roxb. ex. Willd.) DC. (Fabaceae) *Gudbel.*

A perennial twinning shrub, with tuberous roots, often found in dense forests.

Spec. Loc. Cit. : Khokanda RUBL 18935 (*NKS* 1445).

Flowering & Fruiting : November-March.

Medicinal Use : Tuberous roots are crushed to form a paste and 5 gms of paste is given orally once a day for 3 days with equal amount of sugar cake.

12. Ricinus communis (L.) (Euphorbiaceae) *Nandi.*

A large shrub of waste places with fistular stem; leaves palmately 6-12 lobed; flowers unisexual, greenish white; fruit regmas, trilobed, echinate.

Spec. Loc. Cit. : Jhirniya RUBL 9818 (*NKS* 44).

Flowering & Fruiting : January-June.

Medicinal Use : Fresh roots are cut into pieces and boiled with water till the contents become half. The liquid becomes red coloured, and it is filled into a bottle after proper cooling. This mixture is given orally to patient once a day for 5 days. It 's effective for treatment of *'Guinea worm'* disease. The female worms die after its use in human body.

Precaution : This drug therapy is not advisable to young women because of possible sterility threats in women after its use.

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